

**CLAIMS**

This listing of claims will replace all prior listings.

1-10 (CANCELLED)

11. (WITHDRAWN) A rotary-wing aircraft rotor system which rotates about an axis of rotation, comprising:

    a rotor system having an N number of blades which rotates about an axis of rotation at a rotational speed of 1P, such that said main rotor system produces NP vibrations;

    a sensor system which senses the NP vibrations;

    a multiple of independently rotatable masses coaxially disposed with said rotor system;

    a drive system interconnected to each of said multiple of independently rotatable masses to independently rotate each of said multiple of independently rotatable masses relative to said rotor system; and

    a control system in communication with said sensor system and said drive system, said control system operable to identify variations of the NP vibrations to control an angular velocity of at least one of said multiple of independently rotatable masses to reduce the NP in-plane vibrations.

12. (WITHDRAWN) The system as recited in claim 11, wherein said rotor system includes a rotary wing aircraft main rotor system.

13. (WITHDRAWN) The system as recited in claim 12, further comprising a generator driven by said main rotor system which powers an electric motor of said drive system, each of said multiple of independently rotatable masses driven by an electric motor, a phase of

the voltage from said generator providing a phase reference to said control system indicative of a rotational speed of said main rotor system.

14. (WITHDRAWN) The system as recited in claim 11, wherein said drive system rotates at least one of said multiple of independently rotatable masses in a direction opposite to the rotational direction of said rotor system.

15. (WITHDRAWN) The system as recited in claim 11, wherein said drive system rotates at least one of said multiple of independently rotatable masses at an angular velocity greater than an angular velocity of said rotor system.

16. (WITHDRAWN) The system as recited in claim 11, wherein said control system utilizes a phase angle from a power source driven by said main rotor system as a phase angle reference to said control system.

17. (WITHDRAWN) The system as recited in claim 16, wherein said control system communicates with a sensor system interconnected to said main rotor system to provide feedback signals to said control system.

18. (WITHDRAWN) A method of reducing vibrations in a rotary-wing aircraft main rotor system having  $N$  number of blades which rotate about an axis of rotation at a rotational speed of  $1P$  such that the main rotor system produces  $NP$  vibrations comprising the steps of:

- (A) independently rotating a multiple of independently rotatable masses coaxially disposed about an axis of rotation of a main rotor system; and
- (B) controlling an angular velocity of at least one of said multiple of independently rotatable masses relative to the main rotor system to reduce the  $NP$  vibrations of the main rotor system.

19. (WITHDRAWN) A method as recited in claim 18, wherein said step (A) further comprises:

- (a) rotating the multiple of independently rotatable masses driven at one revolution per cycle with the main rotor system.

20. (WITHDRAWN) A method as recited in claim 18, wherein said step (A) further comprises:

- (a) rotating at least one of the multiple of independently rotatable masses in a rotation direction opposite the rotational direction of the main rotor system.

21. (WITHDRAWN) A method as recited in claim 18, wherein said step (A) further comprises:

- (a) rotating at least one of the multiple of independently rotatable masses at three additional revolution per cycle in a rotation direction of the main rotor system.

22. (PREVIOUSLY PRESENTED) A vibration isolation system for reducing vibrations in a rotating system rotatable about an axis of rotation, comprising:

- a multiple of independently rotatable masses coaxially disposed about an axis of rotation of a rotating system;
- a drive system interconnected to each of said multiple of independently rotatable masses to independently rotate each of said multiple of independently rotatable masses about said axis of rotation; and
- a control system in communication with said drive system to control an angular velocity of at least one of said multiple of independently rotatable masses to reduce in-plane vibration of the rotating system.

23. (WITHDRAWN) The system as recited in claim 22, wherein said rotor system includes a rotary wing aircraft main rotor system.

24. (WITHDRAWN) The system as recited in claim 23, further comprising a generator driven by said main rotor system which powers an electric motor of said drive system, each of said multiple of independently rotatable masses driven by an electric motor, a phase of the voltage from said generator provides a phase reference to said control system indicative of a rotational speed of said main rotor system.

25. (PREVIOUSLY PRESENTED) The system as recited in claim 22, wherein said drive system rotates at least one of said multiple of independently rotatable masses in a direction opposite to the direction of rotation of said rotor system.

26. (PREVIOUSLY PRESENTED) The system as recited in claim 22, wherein said drive system rotates at least one of said multiple of independently rotatable masses at an angular velocity greater than an angular velocity of said rotor system.

27. (PREVIOUSLY PRESENTED) The system as recited in claim 22, wherein said control system utilizes a phase angle from a power source as a phase angle reference to said control system.